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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,653	03/30/2007	Wolfgang Stolz	12007-0074	5779

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EXAMINER

QUINTO, KEVIN V

ART UNIT	PAPER NUMBER
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2826

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,653	Applicant(s) STOLZ ET AL.	
	Examiner Kevin Quinto	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 and 27-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 17-22 and 27-32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention here being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on January 12, 2009. Although the applicant argues that claims 17 and 23 have a feature that is common with each other that makes a contribution over the prior art, namely the use of MOVPE or other deep temperature vapor phase epitaxy methods at temperatures less than or equal to 600°C in order to form strain compensating layers, this has not been found to be persuasive since this feature is well known in the art (see Ellmers et al., ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636 and the below rejection). The requirement is still deemed proper and is therefore made FINAL.

Response to Arguments

2. Applicant's arguments filed August 22, 2008 have been fully considered but they are not persuasive. The applicant has canceled claims 1-16 and has presented new claims 17-32. As discussed above, claims 17-22 and 27-32 are withdrawn. Although the new claims add new limitations with regard to the formation temperature of the layers, this has not been found to be patentable over Ellmers et al., ("GaAs-based

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VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636) or the combination of Ellmers et al., ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636) and Bohling et al. (USPN 4,904,616) as seen in the below rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The term "high aluminum-containing" in claim 25 is a relative term which renders the claim indefinite. The term "high aluminum-containing" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The metes and bounds of this claim are unclear since no tolerance is specified as to what constitutes a "high aluminum-containing" layer.

6. The term "slight compressive strain" in claim 25 is a relative term which renders the claim indefinite. The term "slight compressive strain" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one

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of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The metes and bounds of this claim are unclear since no tolerance is specified as to what constitutes a "slight compressive strain."

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellmers et al., ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636).

9. In reference to claim 23, Ellmers ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636) discloses a process which meets the claim. Figure 2 of Ellmers shows a structure formed by a method for the production of semiconductor layer structures wherein tensilely strain compensating layers are achieved for the achievement of a strain control of one or several layers (abstract, p. 631-632) which uses TBAs sources (tertiary butyl arsine) and TBP sources (tertiary butyl phosphine). MOVPE, a commonly known epitaxy method, is used to form the structure (p. 631). With regard to the claimed temperature

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range, Ellmers discloses the use of MOVPE at the temperature of 590-625°C (p. 632).

The examiner would like to note:

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05.

Thus claim 23 is not patentable over Ellmers.

10. With regard to claim 24, the strain-compensating layers are deposited within layers to be compensated in their individual or common strain (abstract, p. 631-632).

11. So far as understood in claim 25, Ellmers makes it clear that aluminum-containing AlGaAs/AlAs layers, slight compressive strain can be tensilely compensated by aluminum due to low concentrations of phosphorus.

12. With regard to claim 26, compression-strained semiconductor layers are compensated for their strain (p.631).

13. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellmers et al., ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636) in view of Bohling et al. (USPN 4,904,616).

14. In reference to claim 23, Ellmers ("GaAs-based VCSEL-structures with strain-compensated (GaIn)As/Ga(PAs)-MQWH active regions grown by using TBAs and TBP," Journal of Crystal Growth, 1998, Elsevier Science B.V., 195, p. 630-636) discloses a process which meets the claim. Figure 2 of Ellmers shows a structure formed by a method for the production of semiconductor layer structures wherein tensilely strain compensating layers are achieved for the achievement of a strain control of one or

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several layers (abstract, p. 631-632) which uses As (arsenic) and P (phosphorus) sources. MOVPE, a commonly known epitaxy method, is used to form the structure (p. 631). Ellmers does not disclose the use of alkyl arsenic or alkyl phosphine compounds. However Bohling et al. (USPN 4,904,616, hereinafter referred to as the "Bohling" reference) discloses that such compounds are known arsenic and phosphorus source materials (column 5, lines 35-53). The applicant is reminded in this regard that it has been held that a mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. See *In re Leshin* 227 F.2d 197, 125 USPQ 416 (CCPA 1960) and also *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Therefore this limitation is not patentable over Ellmers and Bohling. With regard to the claimed temperature range, Ellmers discloses the use of MOVPE at the temperature of 590-625°C (p. 632). The examiner would like to note:

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05.

Thus this limitation is not patentable over Ellmers and Bohling.

15. With regard to claim 24, the strain-compensating layers are deposited within layers to be compensated in their individual or common strain (abstract, p. 631-632).

16. So far as understood in claim 25, Ellmers makes it clear that aluminum-containing AlGaAs/AlAs layers, slight compressive strain can be tensilely compensated by aluminum due to low concentrations of phosphorus.

17. With regard to claim 26, compression-strained semiconductor layers are compensated for their strain (p.631).

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571) 272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leonardo Andújar/
Primary Examiner, Art Unit 2826

/Kevin Quinto/
Examiner, Art Unit 2826